

### REMARKS

Claims 1, 3-11, 13-28, 30-37, and 39-54 remain pending in the present application. Applicant amends Claims 1, 3, 4, 7, 13, 25, 26, 28, 31, 33, 39, 50, 51, 53, and 54 to clarify claimed subject matter and/or correct informalities. The original specification and drawings support these claim amendments at least at pages 10, 22 and in Figures 2 and 3. Therefore, these revisions introduce no new matter. Applicant requests favorable reconsideration of this response and allowance of the subject application based on the following remarks.

#### Statement of Substance of Interview

Applicant appreciates the Examiner's participation in a telephonic conference of October 16, 2007. Applicant wishes to thank the Examiner for his time and consideration.

During the interview, the claimed subject matter of the application and the Liang and Benayon references were discussed. In particular, Applicant presented arguments along the lines of those set forth below in the section entitled "Claim Rejections 35 U.S.C. §103". Specifically, Applicant presented arguments how the Liang and Benayon references do not teach or suggest features as recited in the claims.

Also discussed during the interview were proposed amendments to the claims. In the interest of expediting prosecution of the application, and without conceding the propriety of the rejection, Applicant proposes to amend the independent claims to further clarify features of Applicant's claimed subject matter. Applicant appreciates the Examiner's suggestions for the proposed amendments to overcome the outstanding rejections based on Liang and

Benayon. Applicant submits the amendments in writing in this Response to the Office Action and that all of the pending claims are in condition for allowance.

**Claim Rejections 35 U.S.C. §103**

**A. Claims 1, 3-6, 8, 10, 15, 16, 23-28, 30-32, 34, 36, 41, and 48-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 20040158589 A1 to Liang et al. (hereinafter “Liang”) in view of U.S. Patent No. 6,816,956 B1 to Benayon et al. (hereinafter “Benayon”).**

**B. Claim 7 and 33 are rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to Claims 1 or 28 above, and further in view of U.S. Publication No. 20030056076 A1 to Cook et al. (hereinafter “Cook”).**

**C. Claims 9, 13, 35, and 39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to Claims 1 or 28 above, and further in view of U.S. Patent No. 7,007,269 B2 to Sluiman et al. (hereinafter “Sluiman”).**

**D. Claim 11 and 37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to claims 1 or 28 above, and further in view of U.S. Patent No. 6,915,457 B1 to Miller (hereinafter “Miller”).**

**E. Claim 14 and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to claims 1 or 28 above, and further in view of U.S. Publication No. 20030167421 A1 to Klemm et al. (hereinafter “Klemm 421”).**

F. **Claims 17-20 and 42-45** stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to claims 1 or 28 above, and further in view of U.S. Patent No. 5,909,580 to Crelier et al. (hereinafter “Crelier”).

G. **Claim 21, 46, 53, and 54** stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to claims 1 or 28 above, and further in view of U.S. Patent No. 6,457,142 B1 to Klemm et al.(hereinafter “Klemm”).

H. **Claims 22 and 47** stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liang in view of Benayon as applied to claims 1 or 28 above, and further in view of U.S. Publication No. 20030093433 A1 to Seaman et al. (hereinafter “Seaman”).

#### **Claim 1**

Without conceding the propriety of the stated rejections, and only to advance the prosecution of this application, Applicant amends **independent Claim 1**, to clarify further features of the subject matter. **Independent Claim 1** as amended, recites a computer readable medium comprising stored computer-program instructions executable by a processor for implementing:

**a hosting application implementing a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR;**

**wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR;**

**the runtime hosting interface comprising a host abstraction interface (HAI), the HAI corresponding to execution environment abstraction(s) supported by a the host application, at least one specific interface or object corresponding to a specific HAI accessible by a runtime during execution of runtime managed code and responsive to an action or event associated with an identified HAI, the HAI providing an interface**

for the runtime to configure host execution environment parameters or to notify the host application of a runtime event;  
the host application or the runtime negotiating, which will perform certain functions;  
the runtime allocating memory via at least one specific interface or object implemented by the host application;  
the runtime notifying when a task has been moved to or from a runnable state; and  
the runtime obtaining additional information during process execution.

Applicant respectfully submits that no such method is taught or suggested in Liang and Benayon, which are the primary and the secondary references cited in eight different §103 rejections (shown as Sections A. to H.).

**References Fail to Teach or Suggest Hosting Application for CLR**

First, Applicant asserts the evidence no longer supports the §103 rejections. The eight §103 rejection relies on Liang and Benayon, as the primary and second references. Liang describes a method for enabling comprehensive profiling of garbage-collected memory systems (Title). Liang is directed towards profiling, providing information on how much or how frequently dynamic memory is allocated by each portion (para. [0009]). In Liang, a wide variety of profilers can be accommodated by using a set of virtual machine profiler interface events that are designed to be independent of any method for dynamically managing storage allocation and deallocation in a heap within the virtual machine (para. [0012]).

Applicant's amended Claim 1 now recites in part, "*a hosting application implementing a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR; wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate*

*process execution between the host application and the CLR*". Thus, Liang fails to teach or suggest the features, as recited in Applicant's amended Claim 1.

Benayon fails to compensate for the deficiencies of Liang. Benayon describes control and administration of the supply of memory managed in multiple heaps to a runtime library (Abstract). Benayon is directed towards providing user control of multiple heaps in an operating system (col. 2, lines 64-65). In Benayon, there is no longer a direct communication between the runtime library and the operating system, with the result that the user has full control over heap memory allocation (col. 4, lines 17-21). In contrast, Applicant's amended claim recites in part, "*a hosting application implementing a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR; wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR*". Thus, Benayon does not provide what is missing from Liang to now support the §103 rejection.

Liang and Benayon, alone or in combination, do not teach or suggest the recited features in Applicant's amended Claim 1. Consequently, Applicant submits that the evidence relied upon by the Office is no longer sufficient to support a *prima facie* case of obviousness of Applicant's amended Claim 1.

**Modification Renders Reference Unsatisfactory for Intended Purpose**

Second, the MPEP states, "if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification" (MPEP §2143.01 V.) For

example, using the user control of memory heaps of Benayon would render Liang unsatisfactory for its intended purpose. In particular, the profile interface of Liang would be rendered unsatisfactory to support garbage collection memory systems, if modified by the teachings of Benayon. The modification presented would render Liang inoperable in monitoring and tracing of events that occur during run-time to provide information for garbage collection. Rather, Benayon relies on user control. Thus, there is no motivation to combine the references as proposed. Applicant requests that the §103 rejections be withdrawn.

**The Cited Art Provides No Reason to Combine the References**

The Office stated the reason for modifying the system of Liang with the teaching of Benayon is “because the teaching Benayon would improve the system of Liang by providing a method of determining the availability of minimum size of heap memory and allocating the heap extension to a user application” (Office Action, page 3). Applicant respectfully disagrees.

There is nothing in either of the references that would suggest this reason for combining the references. In addition, Liang already uses a pointer-size thread-local storage (para. [0246]). Furthermore, Liang has a method for managing storage allocation and deallocation (Liang’s Claim 1). Thus, there is no need or reason to combine the two references. The asserted reason relies on hindsight without evidence of teaching or suggestion to propose the suggested combination. Therefore, this rejection is improper for this additional reason.

**Dependent Claims 3-11, 13-27, and 52-53** depend directly or indirectly from independent Claim 1, and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Claim 1, are not taught, or suggested by Liang and Benayon. Applicant respectfully requests withdrawal of the §103 rejections.

**Claim 28**

Without conceding the propriety of the stated rejections, and only to advance the prosecution of this application, Applicant amends **independent Claim 28**, to clarify further features of the subject matter. **Independent Claim 28** as amended, recites a computing device for enhanced runtime hosting, the computing device comprising:

- memory;
- a processor coupled to the memory configured to perform;
- means for identifying, by a runtime one or more execution environment abstractions implemented by a host application, the host application for hosting the runtime;
- during execution of runtime managed code and responsive to an action or event associated with an identified one of the respective execution environment abstractions, means for the runtime to interface with specific ones of the execution environment abstractions;
- means for the HAI providing an interface for the runtime to configure host execution environment parameters and/or to notify the host application of a runtime event;
- means for the HAI providing a pointer interface for the runtime with a pointer to an object associated with the pointer interface, the object for calling by the runtime responsive to a specified event or criteria;
- means for the host application or the runtime negotiating, which will perform certain functions;
- means for the runtime allocating memory via at least one specific interface or object implemented by the host application;
- means for the runtime notifying when a task has been moved to or from a runnable state;
- means for the runtime obtaining additional information during process execution; and

means for the hosting application to implement a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR;

wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR;

wherein the execution environment abstractions correspond to memory management, threads/tasks, I/O completion, synchronization, runtime entry/exit notification, security context, impersonation, runtime configuration, executable service code abstractions, and/or garbage collection (GC).

Applicant respectfully submits that no such computing device is taught or suggested in Igotti, Liang, and Benayon, which are the three main references cited in eight different §103 rejections (shown as Sections I. to P.).

**References Fail to Teach or Suggest Features of Claim 28**

First, Applicant submits the evidence no longer supports a *prima facie* case of obviousness. Eight of the §103 rejection relies on Igotti, Liang, and Benayon, as the three references. For example, Igotti, Liang, and Benayon do not teach or suggest “means for the hosting application to implement a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR; wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR”, as recited in Applicant’s amended Claim 28.

First, Igotti describes the virtual machine is integrated into a generic application (para. [0003]). In Igotti, a developer uses the second category to integrate the virtual machine in a manner that is completely removed from any host application specific information (para. [0028]). Rather, the API in Igotti has shared resources (para. [00290]), not negotiating whether the host application or the runtime perform certain functions, as



recited in Applicant's Claim 28. Therefore, the evidence shows Igotti fails to teach or suggest the features as recited in Applicant's amended Claim 28.

Second, Liang describes a method for enabling comprehensive profiling of garbage-collected memory systems (Title). Liang is directed towards profiling, providing information on how much or how frequently dynamic memory is allocated by each portion (para. [0009]). In Liang, a wide variety of profilers can be accommodated by using a set of virtual machine profiler interface events that are designed to be independent of any method for dynamically managing storage allocation and deallocation in a heap within the virtual machine (para. [0012]). Thus, the evidence shows Liang fails to teach or suggest the features as recited in Applicant's amended Claim 28.

Third, Benayon fails to compensate for the deficiencies of Igotti and Liang. Benayon describes control and administration of the supply of memory managed in multiple heaps to a runtime library (Abstract). Benayon is directed towards providing user control of multiple heaps in an operating system (col. 2, lines 64-65). In Benayon, there is no longer a direct communication between the runtime library and the operating system, with the result that the user has full control over heap memory allocation (col. 4, lines 17-21).

Applicant asserts Igotti, Liang, or Benayon, alone or in combination, do not teach or suggest "means for the hosting application to implement a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR; wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR", as recited in Applicant's amended Claim 28.

Therefore, Applicant submits that the evidence relied upon by the Office no longer supports a *prima facie* case of obviousness of the features recited in Applicant's amended Claim 28. Applicant respectfully requests the §103 rejection of these claims be withdrawn.

Furthermore, there is no evidence of suggestion or reason to modify the reference or to combine reference teachings (MPEP §2142). Applicant respectfully submits that the cited references do not render the claimed subject matter obvious and that the claimed subject matter, therefore, patentably distinguishes over the cited references. For all of these reasons, Applicant respectfully requests that the §103 rejection of these claims be withdrawn.

**Dependent Claims 30-37, 39, and 54** depend directly or indirectly from independent Claim 28, and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Applicant's amended Claim 28, are not taught, or suggested by Igotti, Liang and Benayon. Applicant respectfully requests withdrawal of the §103 rejections.

Applicant respectfully submits that the cited references do not render the claimed subject matter obvious and that the claimed subject matter, therefore, are allowable over the cited references. For all of these reasons, the §103 rejection of these claims should be withdrawn.

**Conclusion**

Claims 1, 3-11, 13-28, 30-37, and 39-54 are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of the subject application. If any issues remain unresolved that would prevent allowance of this case, the Examiner is requested to contact the undersigned attorney to resolve the issue.

Respectfully Submitted,

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